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by the authors of the paper here reviewed are among the most interesting and valuable of any recorded. The present article concisely presents the facts gained and hypotheses suggested by recent observations. While the assimilation of free nitrogen by chlorophyllous plants may be disposed of as not proven, it is assumed by some that it is brought into combination in various ways within the soil under the action of electricity, fungi or micro-organisms, and among the latter the mycorrhiza hyphæ of *Cupuliferæ*, made known by Frank, and the nodules on the roots of certain *Leguminosæ* have been suspected as agents of nitrification. Drs. Lawes and Gilbert are not inclined to attribute any considerable action to the structures mentioned, but, pointing out that while even the feebly nitrogenous sub-soil of Rothamsted (containing only 0.04% of nitrogen) carries some 20,000 pounds of the element per acre, suggest that the Fungi, etc., may serve the crops by in some way bringing this large store of combined nitrogen into a soluble condition for assimilation.—N. L. B.

#### Index to Recent American Botanical Literature.

*Agricultural College of Michigan—Annual Report*, 1887.—L. H.

Bailey, Jr. (Bulletin No. 31, pamphlet, 96 pp.; illustrated.)

This contains a good deal of interesting and valuable information on practical horticulture.

*Bacteria from a Botanical Standpoint*.—Wm. Trelease. (Weekly Medical Review, xvii., pp. 88-92 and 127-131.)

A brief and clear account of these organisms as studied in the botanical rather than the pathological laboratory, though the paper concludes with some pretty strong advice to the physicians of St. Louis regarding the water-supply of the city.

*Botanical Institute at Tübingen*.—Douglas H. Campbell. (Bot. Gaz., xiii., pp. 1-4; with portrait of Dr. W. Pfeffer.)

*Characeæ of America—Part I*.—Dr. T. F. Allen. (Pamph., large 8vo., pp. 64, 55 illustrations; New York, 1888; published by the author.)

The very welcome and long expected results of Dr. Allen's prolonged studies of this neglected class of plants come to us in the form of a beautifully printed and illustrated work which must stimulate their investigation, and for the first time affords a ready

reference to their structure and classification. It gives explicit directions for their collection, an historical sketch of their location in the system from the time of Vaillant (1719), a detailed account of their morphology and anatomy and the development of their organs, and a synopsis of the species, which is to be followed by complete descriptions in the second part of the work. This synopsis was prepared with the co-operation of Dr. O. Nordstedt, and includes the discoveries down to September, 1887. To give an idea of the number of species known, we note that North America affords thirty-one species of *Nitella*, eight of *Tolypella*, and twenty-eight of *Chara*. There is a still larger number of Old World species, while South America has as yet yielded but few, doubtless because they have not been systematically collected. The genera *Lamprothamnus* and *Lychnothamnus* have not been detected in America. Reference is made to the four valuable sets of Exsiccatae distributed by the author, and a fifth one is promised. We trust that the publication of this work will cause collectors to search carefully for these plants and communicate specimens to Dr. Allen. Such labors are apt to be well repaid, for there are certainly still many forms unknown to science.

*Contributions to the Botany of the State of New York.*—C. H.

Peck. (Bull. N. Y. State Mus. Nat. Hist., i., No. 2, May, 1887; pamphlet 8vo., 66 pp., 2 plates.)

This is mainly devoted to the fungi, with descriptions of fifty-seven new species, of which thirteen are figured. A synopsis of the New York species of *Paxillus*, *Cantharellus*, *Craterellus* and viscid *Boleti* is given, and the nomenclature of the New York pyrenomycetous fungi is revised to agree with the system of Saccardo. The following phanerogams have been added to the State flora: *Hieracium Pilosella*, L., *Atriplex hortensis*, L., and *Rhodora Canadensis*, L., the last collected in flower by Mrs. Sampson at Thirteenth Pond, Johnsburch, Warren Co. Its occurrence on Sam's Point, Ulster Co., is reported in the BULLETIN, vol. x., p. 105. It has also been collected by Prof. T. C. Porter at Succasunna, N. J., thus showing a more southern range than Dr. Torrey attributed to it in the New York Flora.

*Distribution and Physical and Past Geological Relations of British North American Plants.*—A. T. Drummond. (Canad.

Rec. Sci., ii., pp. 412-423, 457-469, and iii., pp. 1-21.)

This is an extremely minute and laborious study of the geographical botany of Canada, with the relations of the flora of various regions to that of Northern Europe and Asia. The question of the origin of these floras is discussed in great detail. We fail to see that any very important facts are added to the sum of knowledge on this question, but the minutiae of the investigation are of the greatest interest. Our space forbids a proper presentation of these, and we must merely refer those interested to the above cited journal.

*Elements of Botany*.—Asa Gray. (Revised Edition, 8vo., pp. 226, Ivison, Blakeman and Company, New York, 1887.)

The preface states that Dr. Gray chose for his first and last school book the same name, with an interval of over fifty years between them. This last one leaves little to be desired, unless the illustrations in sections xvi and xvii had been made entirely anew, while the simplicity and clearness of the style and the comprehensiveness of the plan and glossary will make it the most popular of school books. The first fifteen "sections" look and sound very familiar, but in sections xvi., on Vegetable Life and Work, and section xvii, Flowerless Plants, will be seen the greatest number of changes, so that a pupil having carefully mastered this little book will come to the high schools and colleges amply prepared to do some advanced work in botany. The fact that the preface is dated March, 1887, explains why the mistake on page 168, tenth line, should have escaped Dr. Gray. It is hoped that the publishers will remedy this in the next edition by substituting the Fresh-Water Algæ of the United States, by Francis Wolle, for a book now entirely out of print and much behind the present state of knowledge of the subject.

*Erigeron Tweedyi*, n. sp.—W. M. Canby. (Bot. Gaz., xiii., p. 17.)

An interesting new species from Montana, collected by Mr. Frank Tweedy.

*Forestry and Arboriculture in Massachusetts*.—John Robinson. (Annual Report Mass. Board of Agric., xxxv., 1887; pamphlet, pp. 24; reprinted.)

*Garden and Forest*.—*A Journal of Horticulture, Landscape Art*

*and Forestry.* Conducted by C. S. Sargent (Vol. I, No. 1, 12 pp., illustrated.)

The first number fulfills its promise of being a most interesting addition to Botanical journals. The plan of illustrating unfigured American plants, alone, commends it as a long-felt want. This number contains a figure by C. E. Faxon of *Iris tenuis*, with description by Sereno Watson. Plant notes on a half-hardy Mexican *Begonia* and the northern limit of the *Dahlia*, from C. G. Pringle, and some inquiries by W. Trelease as to hybrids between *Ceanothus Americanus* and western species are interesting. An editorial laments the loss of so valuable a friend as Dr. Gray, and Prof. Goodale reviews Gray's "Elements of Botany" and "Kellerman's Kansas Forest Trees."

*Mission Viticole en Amerique.*—Pierre Viala. (Rapport au Ministre de l'Agriculture, pamph., pp. 24, Montpellier, France, 1888.)

After a visit of six months spent in various parts of New Jersey, Maryland, Virginia, North Carolina, New York and Ohio, the Professor of Viticulture in the National College of Agriculture pronounces *Vitis Berlandieri*, *V. cinerea* and *V. cordifolia* as being the most likely to succeed in the calcareous soil of southern France as stock for grafting.

*Mycologic Flora of the Miami Valley, Ohio.*—A. P. Morgan. (Journ. Cincinnati Soc. Nat. Hist., x., pp. 188-202; continued.)

*New or Noteworthy Species.*—II.—Edward L. Greene. (Pittonia, i., pp. 159-164; advance sheets.)

*Trifolium scabrellum*, *Saxifraga Marshallii*, *Potentilla daucifolia*, *Cryptanthus Rattani*, *Allocarya hirta*, *Arabis purpurascens*, Howell, *Cardamine gemmata*, *Cedronella rupestris* and *Triteleia Hendersoni*, are new species; and interesting notes are given on *Rhamnus rubra*, Greene, *Astragalus Magdalenæ*, (*A. candidissimus*, Watson, not Ledeb.), and *Viscainoa geniculata*, a new genus founded on the *Staphylea geniculata* of Kellogg; *Potentilla Utahensis* is the *Ivesia Utahensis*, Watson.

*New Species from Mexico.*—Edward L. Greene. (Pittonia, i., pp. 153-159; advance sheets.)

Professor Greene describes the following new plants collected by Mr. A. Forrer, in 1881, on the Sierra Madre back of the city of Durango:—*Dalea cyanea*; *Astragalus Daleæ*; *Sedum diver-*

*gens*, (this name altered to *S. Forreri*, l. c., p. 162, as the former was already used by Dr. Watson for an Oregonian species); *Hypericum parvulum*; *Ranunculus Forreri*; *Valeriana rhomboidea*; *Achæotogeron Forreri*; *Gentiana superba*; *Lithospermum tubuliflorum*; *Verbena subuligera*; *Hedeoma jucunda*; *Salvia Forreri*; *Stachys venulosa*; *Cedronella coccinea*; *Zebrina* (?) *pumila* and *Calochortus venustus*. *Salvia aliena* is characterized from specimens in Herb. Cal. Acad., collected on Maria Madre Island.

*Paraffine-imbedding method in botany—The application of.*—J.

W. Moll. (Bot. Gaz., xiii., p. 5.)

*Peppers—Notes on—Capsicum.*—E. Lewis Sturtevant. (Agric. Sci., ii., pp. 1-4.)

The writer cultivated during 1887, fifteen sorts from Brazil, fifteen from Mexico, one from Africa and twenty-five varieties from seedsmen, besides keeping notes on 49 others grown in previous years. Observations are recorded on the variations in color, shape, position of fruit and rapidity of drying when mature, though the author defers "till a later period the consideration of specific relations within the genus" concluding that the "number of species accepted by botanists will be few."

*Potamogeton fluitans*, Roth.—G. Tiselius. (Nordstedt's Botaniska Notiser, 1887, pp. 260-264.)

"American specimens of *P. lonchites*, Tuckerm., show also that they are nothing else than *P. fluitans*, Roth., an opinion shared by the Rev. Thos. Morong, who has occupied himself a good deal with the family in question and is well acquainted with them. *P. lonchites*, Tuckerm., must accordingly be received as synonymous with *P. fluitans*, Roth." Dr. Tiselius concludes also that *P. Illinoensis*, Morong, is only a form of *P. natans*.

*Seeds and how they travel.*—Byron D. Halsted. (Chatauquan, viii, p. 275.)

*Taphrina.*—*Notes on the Genus.*—Benjamin L. Robinson. (Annals of Bot., i., pp. 161-176, reprinted).

*Thomas Bridges, Botanist.*—R. E. C. Stearns. (West American Sci., iii., pp. 223-227.)

*Tumble-weeds again.*—C. E. Bessey. (Amer. Nat., xxii., p. 66.)

This time it is *Corispermum hyssopifolium*, L.

*University of California Agricultural Experiment Station.* Bulletin No. 76.

Among the reports of the distribution of seeds and plants conducted by this most admirable institution, we note that the Camphor Tree (*Cinnamomum camphora*) has proved a hardy and rapid grower in many parts of California; that there are now cork oaks of bearing dimensions in five counties of the State; that the true Gum Arabic Tree (*Acacia Arabica*) may be grown in the thermal belts, and that the Tea Plant thrives in many sections, and in some cases the leaves are gathered for home use.

### Proceedings of the Club.

The regular meeting of the Club was held on Tuesday, Feb. 14, at Columbia College, the President in the chair and 42 persons present.

Miss Isabel S. Arnold, Dr. J. W. Eckfeldt, Rev. Francis Wolle, Thos. Meehan, and John Donnell Smith were elected Corresponding Members.

Miss Emily L. Gregory was elected an Active Member.

The following standing committees for the year were appointed:

Finance, J. L. Wall, W. H. Rudkin; Admissions, Benjamin Braman, Jos. Schrenk; Herbarium, Louise M. Stabler, Alice B. Rich.

Dr. Britton called attention to the proposed collecting tour of Rev. Thos. Morong, in South America, and, on motion, the Secretary was instructed to prepare a letter of indorsement on behalf of the Club, under which he will be authorized to act in the name of the Club during his travels.

On motion the President appointed Hon. Addison Brown, Mrs. N. L. Britton and Benjamin Braman a committee to take suitable action on behalf of the Club in regard to the death of Dr. Asa Gray. Remarks upon Dr. Gray and his works were made by Dr. Newberry and Dr. O. R. Willis. Dr. Britton exhibited a photograph, taken shortly before his death, and read some of his early letters to Dr. Torrey, which were preserved among Dr. Torrey's correspondence.

The Committee framed the following preamble and resolutions: